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# A Pilot Study of Law Enforcement Officer Perceptions of Noise Induced Hearing Loss

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Running Head: LAW ENFORCEMENT PERCEPTIONS ON HEARING LOSS

University of Northern Colorado  
Greeley, Colorado

A Pilot Study of Law Enforcement Officer Perceptions of Noise Induced Hearing Loss

A Thesis Capstone

Submitted in Partial Fulfillment for Graduation with Honors Distinction and the Degree  
of Bachelor of Sciences in Audiology and Speech Language Sciences

Brianna Ott  
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Advisor: Mrs. Lyda McCartin

DECEMBER 8<sup>th</sup> 2018

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### Abstract

Noise Induced Hearing Loss (NIHL) is an effect on an individual's hearing due to exposure to excessive noise that results in a particular form of hearing loss, most frequently recognized by the presence of a "noise notch." An individual should receive less than eighty-five decibels of sound over an eight hour time period to ensure their hearing does not become damaged. Law Enforcement Officers (LEO) is a population which uses loud tools throughout a shift, most notably sirens, radios, and firearms, all of which may contribute to overexposure of sound. This study examines the perceptions of LEOs on noise in their career and the consequences of being subjected to noise. This study seeks to understand noise sources a LEO may encounter, how concerned officers are about their risk of NIHL and their perceptions about preventing NIHL.

This study involves qualitative data consisting of a set of questions answered by 76 Law Enforcement Officers. The survey asked questions about job-related noise sources and LEO's concerns about wearing hearing protection. The data may be beneficial to law enforcement administrations to consider awareness education about damaging the officer's hearing due to noise exposure. The study found that while most officers were concerned about losing their hearing, the officers were more afraid that being forced to wear hearing protection would inhibit their ability to hear their surroundings properly, thus placing them at greater risk for injury or death. It was clear more training and education in the field of NIHL may be beneficial, as 91 percent of the responses indicated they had not received any training about hearing loss. Further research should be completed to understand if there is a way to mediate radio sounds from dispatch, as radio was the most frequently reported noise source concern.

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## Table of Contents

Title Page	1
Signature Page	2
Abstract	3
Statement of the Problem	7
Literature Review	8
Project Design	16
Results	18
References	25
Appendices	28
IRB Approval	33

## List of Figures

<i>Figure 1.1.</i> Self-Reported Hearing Loss	19
<i>Figure 1.2.</i> Officer Training on Noise Induced Hearing Loss	19
<i>Figure 1.3.</i> Officer Concerns about Hearing Protection	21
<i>Figure 1.4.</i> Noise Sources	23

### **Statement of the Problem**

Of the forty million people who have been diagnosed with hearing loss, ten million have hearing loss directly contributed to over-exposure to noise (Levy, Fligor, Ginocchi, & Kagimbi, 2012). This type of hearing loss, caused by exposure to environmental noise with decibel levels over eighty-five decibels for an extended period of over eight hours, is defined as Noise Induced Hearing Loss by the American Speech Language Hearing Association (ASHA). With the recent pandemic of noise induced hearing loss sweeping across the United States of America, there has been significant research conducted on how to preserve the population's hearing (World Health Organization [WHO], 1997).

Law Enforcement Officers may be at risk for Noise Induced Hearing Loss (NIHL) due to the extreme environmental noise they are exposed to during a daily work shift. Retired LEOs are often plagued by the effects of tinnitus, constant ringing in the ears (Alan Price, personal communication, March 2017). Even if a police officer never fires his service weapon, the other noises that an officer encounters on a daily basis such as radios, sirens, and environmental sounds are detrimental to their hearing health.

Although there has been significant research completed in the field of Occupational NIHL in many industrial settings over the past few decades, there has been little research concerning the risk of law enforcement's exposure to these same dangerous decibel levels that they may encounter on a daily basis. According to research completed for other occupations in the First Responder categorization (Hong & Samo, 2007) police officers are at risk to encounter significant decibel ranges during their normal work shift that have the capability of causing immediate loss of hearing. Many other countries have



become proactive in engaging in research to produce methods to protect their law enforcement officer's hearing (Lesage, Jovenin, Deschamps, & Vincent, 2009; Reid, 2004; Venkatappa & Shankar, 2012; Win, Balalla, Lwin, & Lai, 2015). Yet research in the United States is outdated and inconclusive of any risk that officers may encounter in everyday life, instead focusing almost exclusively on other occupational environments.

### **Literature Review**

In a given work day, a police officer may experience noise exposures that can exceed 177 decibels (Lobarinas, Scott, Spankovich, & Prell, 2016). As described in a previous study conducted by Gilbertson and Vosburg (2015) certain types of officers may experience different types of environmental noise, resulting in different levels of noise exposure among law enforcement officer specializations.

### **Officer Specializations**

#### **Patrol Officer**

A patrol officer is defined as any officer tasked with protecting the general public without executing collateral duties. In a study evaluating whether officers from small departments are more likely to experience what is considered dangerous noise levels than the civilian population, it was determined that there were no elevated exposures in any single population (Gilbertson & Vosburg, 2015). Although both canine and motorcycle officers experienced noise exposures significantly larger than regular patrol officers, their levels were still considered safe by OSHA regulations. This study only included patrol officers completing their shifts at low-speed ordinance locations, which should be taken into account as a possible skew of the data, as the selected officers did not experience the same expected decibel levels as those in a high-speed ordinance such as highway patrol

(Gilbertson & Vosburg, 2015). In another similar study conducted in France, it was discovered that 28 percent of the evaluated police officers had been diagnosed with hearing loss, whereas only 16 percent of the civil servants in the population had been diagnosed with hearing loss. The results of this study suggest that the French police officers were at a higher risk for hearing loss than any other of the civil servant careers. These researchers suggested that since they had ensured that no data was taken from training exercises, due to the highly regimented use of noise protection devices during such exercises, the elevated levels are most likely due to a combination of differing environmental stimuli. These stimuli include exposure to noises such as vehicle horns, vehicle sirens, surrounding traffic noise, dog barking, or motorcycle engines (Lesage, et al, 2009). Audiometric tests were taken from the medical records of the police officers and were evaluated for hearing loss in the 4000 Hz designation as well as evaluated for overall hearing loss. Of 1,692 subjects, it was found that police officers were at a 1.4% higher risk for NIHL than civil servants, with the greatest proportion of affected officers being motorcycle officers (Lesage, et al, 2009).

Another study that involved audiometric testing of over three hundred individuals' found NIHL in 34.2% of their police personnel. NIHL was more prevalent in males than females, and men aged 30-39 had the highest prevalence. Those that served on the force for more than 16 years demonstrated the highest overall rate for both males and females (Win, Balalla, Lwin, & Lai, 2015). This data suggests that years in the force may be a considerable factor in the risk of noise induced hearing loss for any individual.

### **K9 Officer**

A K9 officer is defined as any officer that uses the specialized tool of a canine

partner to complete their daily work responsibilities. The significant different environmental noise that affects these officers is the presence of the canine throughout long extended periods of the day. It is expected that the presence of noise induced hearing loss due to a canine dog will differ based on the classification of the dog as a Detection Dog or a K-9. A Detection Dog is typically a spaniel that specializes in detection of chemicals and explosives. A K-9 dog is typically a German Shepherd or Belgian Malinois that specializes in suspect apprehension.

In a study conducted by NIOSH, Canine Officers in the Cincinnati Police Department did experience more elevated levels of decibel exposure than expected. Although one canine officer experienced a 145% daily dose during the noise dosimetry test, the researchers were reluctant to attribute the elevated dose to only the dog, as they had neglected to distinguish the dog's noise from other environmental stimulus. Furthermore, they claim that their sample size of nine police officers was far too small to draw a generalized conclusion from, and that their findings cannot be applied to an overall population (Achutan, 2006). In another study evaluating the effects of environmental noise on police officers divided into small and large departments, the canine officer was one of the only ones whose daily activities significantly impacted their daily noise dose (Gilbertson & Vosburg, 2015). Due to the possibility that the presence of the dog may result in a 145 percent daily dose for an officer, the K9 Officer duty role should be further studied to identify the most dangerous noise exposure for an officer.

A study conducted on canines in the Royal Air Force of Britain found a distinct difference in the amount of noise exposure that a patrol officer or a canine officer may experience on a daily work shift (Reid, 2004). This difference in exposure is mostly due

to the animal being transported in vans or aircraft. The testing of the environmental noise tests the elevated risk of noise induced hearing loss. Audiometric testing, instead, evaluates the overall hearing loss of a particular officer. This type of testing has no way of isolating previous noise exposure that may have occurred, for example, during time in the military, or other occupations. Thus, during audiometric testing there were no recorded differences in the hearing loss between the dog handlers and the normal patrolmen (Reid, 2004). Even though there was not a dangerous amount of recorded noise exposure, it was suggested that the dog handlers be educated about their exposure, and efforts take place to ensure that their hearing is protected in the future. This study suggests that civilian police dogs may react differently to daily duties than the Royal Air Force canines, and the results of this study should not necessarily be the conclusion to all effects of noise on all dog handlers across the nation (Reid, 2004). Furthermore, since each dog has its own personality and behaviors, it is possible that certain dogs will have a higher contribution to the noise exposure of their handlers. The most surprising data that is not included within this research article is that within the Royal Air Force, both Spaniel breeds and Shepherd breeds are utilized on a daily basis, and may be a determining factor when considering the effects the canines have on their handlers (Reid, 2004).

### **Traffic Officer**

Since the studies included within this section were recorded in many other countries, where the definition of traffic officer may be more fluid and encompass a larger range of police officers, traffic officer should be defined as an officer assigned to maintaining traffic, highway, and vehicle enforcement.

According to another study, traffic police may be at the highest risk of noise

induced hearing loss in other countries such as Myanmar and Pune (Singh & Mehta, 1999; Win, Balalla, Lwin, & Lai, 2015). Since there has been little research done on this specific field of interest in The United States of America, the data found in this study may be the only viable research determining traffic officer's significant risk of finding increased damage later in life. In a study conducted on traffic police in Pune, India, all of the subjects had normal hearing before becoming a traffic officer. Out of the 412 personnel, as many as 342 people had raised hearing thresholds noting a possibility of NIHL. Those who served two or less years in the police service had a noticeably different amount of hearing loss than those who served longer, suggesting that exposure duration is a factor in the rate of hearing loss. Three audiometric tests were found to be most common, including a descending curve, notching, and flat curve. These classifications of audiometric tests are those that would be found in people who had experienced noise induced hearing loss (Singh & Mehta, 1999). The audiometric test results, however, cannot prove direct causation of the noise exposure during work as the only stimulus the officers may have encountered.

The second study evaluating the risk of traffic officers involved research into the psychosocial aspect of their lives after experiencing damaging levels. The various noise levels varied on average from 86-120 decibels. The most common physiological effects were aggravated depression, irritation, public conflict, hypertension, and stress. Damaging levels also included heightened annoyance, various behavioral effects, and speech interference. Hearing had been impaired in 69% of the participants. This impairment increased as the time exposed to noise pollution increased (Tabriz &

Ahmad, 2015). However, this article also failed to separate the exposure to traffic noise as the only environmental stimulus, which may lead to a skew of the data.

Both of these studies were conducted in countries where officers experience different noise exposures than one would expect to find in United States cities. Due to the difference between environments, the lack of definition of what constitutes a “traffic officer”, and the possibility that many different results may have been based upon regulations of other countries, one should be reluctant to apply the results of these studies to United States traffic officers. However, these studies demonstrate a need for more research to be conducted on police officers within the United States to determine if the officers serving us on a daily basis are unknowingly submitting themselves to danger in a way they did not anticipate. These articles suggests that the concern about noise induced hearing loss should be classified as an important consideration that should be researched moving forward to determine if traffic officers should be evaluated for a heightened risk of noise induced hearing loss.

### **SWAT Team Officer**

A SWAT team is often defined as a “para-military” organization. Thus, their risks of noise exposure are closest to the noise exposure risks experienced by members of the military. For the purpose of this study, a SWAT member will be any officer who has earned the designation of SWAT within their department. A SWAT team is characterized by the use of military tools and weapons such as AR-15 rifles, and military vehicles. The tools used on a daily basis include flash-grenades, suppressed rifle fire, pepper guns, grenades of various distinctions, and military issued trucks.

Although one may believe that the occasional use of a suppressor on a sniper rifle is sufficient in protecting officer hearing, a suppressor is an almost entirely ineffective form of protecting hearing. A suppressor should not be considered a hearing protection device, nor should the presence of a suppressor be considered a substitute for a hearing protection device (Lobarinas, Scott, Spankovich, & Prell, 2016). Furthermore, SWAT tools and techniques used during deployment are most often classified as military weapons, and can be most closely linked to noise exposure similar to military occupational risks. The SWAT team at each police station, however, is not dispatched on a daily basis, as their role is only required during extenuating circumstances. During the rest of their career on the police force, SWAT officers tend to serve in a completely separate specialization, such as patrol officer. Thus, an overall audiometric test should not be used to determine the risk factor of their exposures since they are not usually exposed to the same types of environmental stimuli across a year.

In a study conducted in Fort Collins, Colorado, 93 officers tested their service weapons to determine if their hearing protection was supplying sufficient protection from decibel levels. The measurement of their individual weapons fell within 167.9 and 160.8 decibel peak SPL. The highest peak pressure were 168.6 and 166.8 decibel peak SPL. These levels are considered dangerous enough to cause instantaneous damage (Tubbs, 2003). Within the Finnish Defence Corps, research conducted on special operation training teams found the average noise exposure of such exercises to be 116 decibels, and the peak levels projected upwards of 154 decibels. During combat exercise, the average levels ranged from 95-97 decibels, with exceptions for the explosives and bazookas

(Paakkonen, 2005). As SWAT utilizes many of these same explosive devices and weapons, their daily noise exposures may be similar.

The AR-15 is the rifle distributed to multiple police departments across the nation as the standard. One research study conducted found that this specific weapon's measured levels for a standard 20 inch barrel ranged from 165-172 dB peak SPL, and 172-177 dB peak SPL for a 10.5 inch barrel. The sound levels generated by unsuppressed rifles with these barrel lengths generate extremely dangerous levels for officer exposure. Suppressors significantly reduce the peak dB SPL rating, but they do not replace the need for hearing protection at a firing range (Lobarinas, et al., 2016). In another study involving the type of pistol and revolver distributed to police in Brazil, the peak measurement from the digital sound level meter was 113.1 decibels from a .40 caliber pistol, and 116.8 decibels from a .38 caliber revolver. Audiometry testing of these officers yielded a result of hearing loss at 4000 hertz in approximately 86.7% of the population. This frequency specific hearing loss is what is described as a "notch" loss, and indicative of noise induced hearing loss (Guida, Diniz, & Kinoshita, 2011).

Depending on the specific call, a SWAT team's noise exposure may be considered low or heightened due to the differing tools and techniques that may be used during each response. Results from a study on a single SWAT team cannot be applied as a definitive measurement for all SWAT teams in the United States.

### **Discussion**

Hearing loss in police officers is an important issue that should be evaluated and studied to offer better health and wellness care for those who sacrifice themselves to protect their country. It appears that even though this research is considered important in



other countries, hearing loss in police officers is a subject almost entirely dismissed by researchers in The United States. The research that is done may provide better health care and preventative care that will positively affect police officers currently serving in the force, as well as provide them with health benefits that will exist even after their retirement. Investigation into the hearing loss of police officers will help in expanding the longevity of their career, as well as prevent early onset presbycusis.

Many current studies have found that the lack of education and awareness in the field of law enforcement cause a heightened risk of noise induced hearing loss (Venkatappa & Shankar, 2012). Therefore, more education for police officers into the awareness of the prevalence of noise induced hearing loss may reduce risk of noise induced hearing loss in the United States police force. Currently, due to the lack of research in the field, few police officers are even aware of the risk that their career poses to their hearing health. Without acknowledging the prevalence of this new form of pollution, officers may be unknowingly putting their own health at risk on a daily basis. With research and publication of results, police officers may be advised of proper protection methods and be offered ways of ensuring their hearing health remains within normal limits.

### **Project Design**

This study investigates how law enforcement officers in Colorado perceive the risk of noise induced hearing loss, and their perceived challenges with wearing hearing protection during their daily shift. Through a qualitative survey, officers reflected on their awareness of noise induced hearing loss, their specific concerns about hearing loss, the sources of noise they perceive as too loud for their hearing health, and what challenges may be imposed should it be mandated they wear hearing protection during their shift.

Officers were asked to rank their concern about hearing loss on a scale of 1-5, where 1 represented no concern, and 5 represented they were very concerned.

### **Research Questions**

1. How have Law Enforcement Officers been educated about Noise Induced Hearing Loss, and do they currently implement any techniques of hearing conservation in their daily shift?
2. How concerned about hearing health are Law Enforcement Officers?
3. How may mandated hearing protection interfere with their daily duties and personal safety in their career?
4. What noise sources are Law Enforcement Officers most concerned about?

### **Methods**

#### **Participants**

Participants in this study included Law Enforcement Officers from different departments in Colorado (n=76). The departments consisted of local level Sheriff's Offices (36), police department (1), and a state level agency (39). No one was excluded from this study based on race, gender, or perceived disability. Officers were not required to participate in this study. Participants received the survey by personal email from the researcher, or from a fellow officer.

#### **Procedure**

Participants consisted of known officers employed in the participating departments from a convenience sample. Participants read a consent paragraph at the top of the survey, and consent was implied by their completion of the survey. The

participants were asked a set of demographic questions including their department, age, and gender. A set of open ended questions followed (See Appendix B).

### **Analysis**

The data was analyzed based on the qualitative results. It was organized to reflect the average age, the average level of concern, and the average number of years in service as a LEO. The average level of concern was calculated based on the numeric value given to select choices. The open ended questions were analyzed by detecting consistent terms that were mentioned, and those that differed from one another. Concerns were categorized into awareness (officer safety), comfort, practicality, and effectiveness.

## **Results**

### **Data Summary**

76 participants fully completed the survey. The age range of participants was 25 to 71 years of age with an average age of 44. The study consisted of 68 males and eight females. The difference in gender was due to convenience sampling, and the selected departments demographics consisted of mostly male officers. The average years of service was 16.5 years, with a range of 2.5 to 36 years. The results consisted of answers from many different officer specializations, including SWAT, K-9, firearms instructors, bomb squad, patrol, and motorcycle. The officers self-reported on their own hearing loss. The majority (71 percent) had hearing loss of some kind. Of those 71 percent, some had hearing loss (37 percent), few had just tinnitus (22 percent), and some had both hearing loss and tinnitus (41 percent) (Figure 1.1).



Figure 1.1 Self-Reported Hearing Loss

### Research Question 1

How have Law Enforcement Officers been educated about Noise Induced Hearing Loss?

Ninety One percent of the officers had not received any training about Noise Induced Hearing Loss or its prevention (Figure 1.2). Only two percent of the officers reported they had received unit specific training, such as for SWAT or bomb squad, and seven percent reported they had received some knowledge from outside of the job, such as personal hearing screenings, or military provided training.

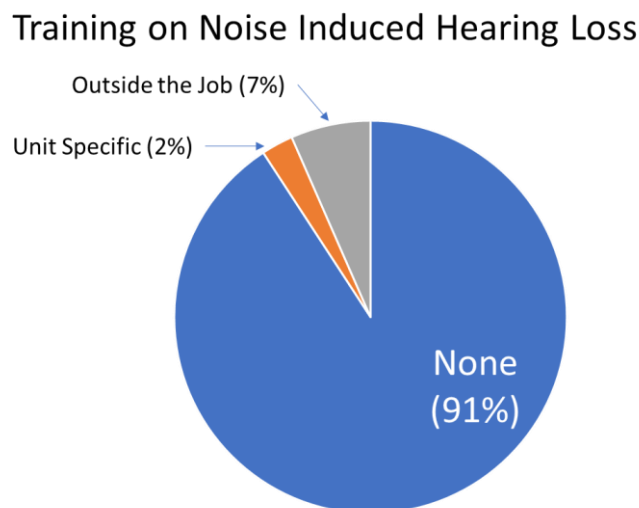


Figure 1.2. Officer Training on NIHL

**Research Question 2**

How concerned about hearing health are Law Enforcement Officers?

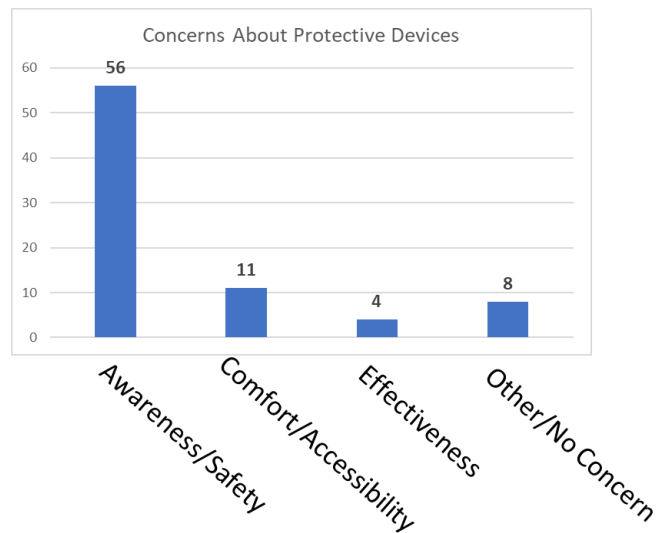
Participants were asked to rank their concern about hearing loss on a scale of 1 to 5. The average of the responses was 3.4, translating to an average of moderately concerned. The standard deviation was 1, meaning a significant majority of the officers were between 2.4 and 4.4 on a scale of 1 to 5.

**Research Question 3**

How may mandated hearing protection interfere with their daily duties and personal safety in their career?

The main concern about wearing hearing protection during the daily duties was overwhelmingly awareness and officer safety (56) and concern about danger if the officer could not hear minor sounds within their surroundings. The participants commented they felt hearing protection would be synonymous with the inability to hear danger. Eleven officers were concerned with the comfort or accessibility of hearing protection, with only four officers concerned with the effectiveness of the hearing protection (Figure 1.3).

Quotes from responding officers were consistent in revealing significant concern for safety as a trade-off for protection of hearing. The quotes were very explicit about a broad range of sounds that are required for an officer to maintain situational awareness and personal safety.



*Figure 1.3. Officer Concerns about Hearing Protection*

“It is a huge officer safety hindrance. I’d rather go deaf slowly than get killed quickly because I didn’t hear something that I should have heard someone sneaking up on a traffic stop or someone shooting at me from far away”

“I do not believe that ear plugs or ear muffs are a viable option to combat this issue. Law Enforcement officers need their sense of hearing just as much as they need their sense of sight or touch. Dulling the hearing ability would cause issues with ability to monitor the radio, communicate with the public, communicate with team members, hear traffic, etc”

” Where do I start... Skidding tires, witness statements, calls for [service], the sound of a [revving] engine, the yell of a fellow officer to watch for a specific danger. All these things require unobstructed hearing.”

“You must be able to clearly hear the person you are talking with. If you miss something you may miss a clue to your investigation. 2) wearing ear plugs may prevent you from hearing something that is going to harm or kill you. - example a car skidding on ice is a very subtle low sound, but if you don't hear it, you don't have the chance to jump out of the way. I have worn ear plugs during traffic contacts before, but while the plugs protect the hearing they isolate the person wearing them. Noise canceling ear plugs are the idea, but the frequency they rule out is very similar to the frequency we need to hear”

“Would not want anything bulky that tethers me to anything such as the firefighters use in the cab of the fire apparatus. I would gladly wear ear plugs providing that they did not inhibit my ability to hear subtle noises such as someone walking up behind me or moving in the brush near me. If there were small hearing aid size devices with ANR for acute loud noise and filtering

constant background noise, I would absolutely wear them daily. Would not want anything bulky that tethers me to anything such as the firefighters use in the cab of the fire apparatus. I would gladly wear ear plugs providing that they did not inhibit my ability to hear subtle noises such as someone walking up behind me or moving in the brush near me. If there were small hearing aid size devices with ANR for acute loud noise and filtering constant background noise, I would absolutely wear them daily.”

#### Research Question 4

What do LEO's perceive as being the loudest noise they are subjected to on a daily basis?

Analysis of the participant comments revealed that the officers believe radio, sirens, traffic, and firearms were the loudest noise sources they encountered on a daily basis.

Thirty eight of the officers reported radios as the loudest noise source. Traffic (33) and firearms (30) were the next most often cited noise sources with sirens (24) reported less often (Figure 1.4).

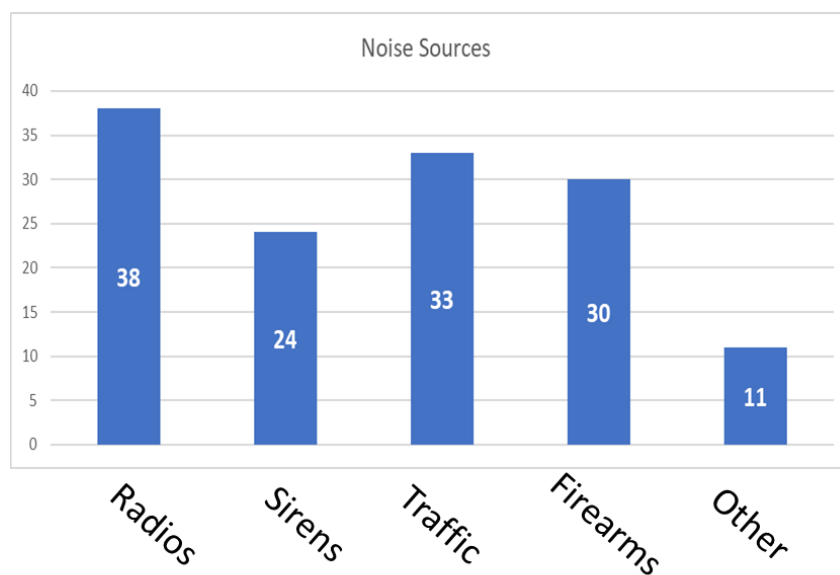


Figure 1.4. Noise Sources

It should be noted those concerned with firearms were mostly concerned with the need to put down animals, and acknowledged it was a very infrequent occurrence, completed by few officers with that specific collateral duty. Quotes in the responses were very clear about the persistent noise from radios and traffic.

“Radio pac-set ear piece, sirens, and gun fire. I do believe that any of those specific noises can damage hearing. Gunfire on duty is rare, and practice is always done with ear phones so I'm not as worried about that. Most of us in law enforcement have had the issue of exiting a vehicle quickly to deal with a suspect and not turning off the siren, and I have experienced the discomfort of being next to a patrol car with its siren still running. My biggest concern however, is having to listen to my pac-set radio with an ear piece for 10+ hours a shift. The ear piece is very convenient and provides better officer safety, but the long term affects may be detrimental.”

“Gunfire (dispatching injured animals after a crash I can usually put in some ear-pro, and only 1-2 shots...if there's ever a sudden shooting then no protection to multiple shots), Traffic Noise (being less than 20 feet from vehicles going 35-90 miles an hour), Radio traffic (I wear an ear piece constantly, sometimes it gets bumped up and my ear is blasted).”

“Firearms at the range without hearing protection in years past, putting down deer on patrol without hearing protection, Motorcycle Officer noise from Harley Davidson motorcycles and loud radio in helmet”

### **Discussion**

This study suggests that there is an associated problem between the daily shift duty of LEOs and hearing loss. Seventy one percent of participants self-reported significant hearing issues. The average amount of concern indicated that officers are concerned about hearing loss, have felt its effects, and demonstrate a significant amount of concern, 3.4 on a scale of 1 to 5. The results also suggest that there is very little training offered to officers about how to prevent hearing loss or noise induced hearing loss (91 percent had no formal instruction). The officers are concerned about noise



sources other than firearms, but this research suggests that these concerns may be outweighed by the concern that wearing hearing protection contributes to a lack of awareness potentially compromising officer safety. This data suggest that there needs to be more research into effective formal training for law enforcement officers on how to protect their hearing.

### **Future Research**

The overwhelming finding of this study is that many officers would rather risk their hearing than risk their life. These participants noted hearing protection is synonymous with hearing suppression. Thus, more research should be completed to find a method of hearing protection that will not compromise the awareness of officers as it contributes to officer safety. A broader study should be completed to understand if officers across the state of Colorado as well as officers nationwide share the same concerns and views about the dangers of wearing hearing protection.

Because officers indicated that daily radio noise impacted their hearing, research should also be conducted with radio manufacturers to discover if there is a way to mediate the decibel noise that officers are receiving on a daily basis due to radio's being manually turned up and down. The limitations of the study include lack of broad department participation, as only two agencies were willing to participate in this study in a significant way. Whilst the results may be representative of the respective departments, the data is not representative of all Colorado law enforcement, or law enforcement from other states. Future research should expand this survey to more Colorado agencies and agencies nationwide.

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Appendices

## Appendix A: Consent Form



CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH  
UNIVERSITY OF NORTHERN COLORADO

**Project Title: A Pilot Study of Law Enforcement Officer Perceptions of Noise Induced Hearing Loss**

Researcher: Brianna Ott  
Lyda McCartin

Research Advisor:

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email:

I am researching how Law Enforcement Officers perceive the risk of Noise Induced Hearing Loss as a consequence of their career. As a participant in this research, you will be asked to take a short survey. The survey will consist of a small number of "fill in answer" questions that will be used to evaluate your knowledge about the topic as well as your own perceptions about the loudness of tools in your career. The survey will take approximately 15-25 minutes.

For the survey, you will not provide your name, but you may be asked to provide the name of the department you are associated with, your age, gender, and how long you have been a member of law enforcement. Therefore, your responses will be anonymous. Only the researcher and the researcher's advisor will have access to individual responses. Results of the study will be presented in group form only (averages), and original paperwork will be kept in a reasonably secure facility until destroyed at the end of the study.

Risks to you are minimal. The benefits to you include informing administration about proposed need for education or better awareness amongst Law Enforcement about Noise Induced Hearing Loss. Your participation is voluntary. You may decide to no longer participate in this study after already beginning, and you may withdraw at any time. If you decide to participate, the completion of the survey indicates your consent. Please keep or print this form for your records.

If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

## Appendix B: Survey

**A Pilot Study of Law Enforcement Officer Perceptions of Noise Induced Hearing Loss**

*Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. The completion of this survey will be considered as your consent to use the results in a published thesis. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.*

Agency/Department: \_\_\_\_\_

Gender: \_\_\_\_\_ Age: \_\_\_\_\_

How long have you been a member of a law enforcement agency?

\_\_\_\_\_

Are you a member of a specialized unit (ie. K9, SWAT)? If yes, please explain type and duration.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1. Do you believe you have hearing loss? Have you experienced the sensation of ringing in your ears? Please explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. On a scale of 1-5 how concerned are you about your hearing health?

1	2	3	4	
	5			
Not Concerned	A Little Concerned	Moderately Concerned	Concerned	Very Concerned

3. What do you believe is the loudest sources of noise in your daily job, do you believe this specific noise sources can damage your hearing?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



4. Have you ever received any formal training about noise and hearing loss? Where, when, and what type of instruction? Did you find the training helpful?

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5. What are your greatest concerns about wearing hearing protection (ear plugs or muffs) during your daily job?

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## Appendix C: IRB Exempt Approval

*Institutional Review Board*

DATE: November 21, 2018

TO: Brianna Ott

FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1336471-3] A Pilot Study of Law Enforcement Officer Perceptions of Noise Induced Hearing Loss

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: November 20, 2018

EXPIRATION DATE: November 20, 2022

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or [nicole.morse@unco.edu](mailto:nicole.morse@unco.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.